General Motors LLC
FRN 0029124476
Application for FCC Experimental License
OET File No. 0023-EX-CN-2022

SUPPORTING STATEMENT

General Motors LLC ("GM") is a leading innovator and collaborator in the development and implementation of intelligent transportation systems ("ITS") technologies for vehicles. These technologies hold great promise to enhance driver and pedestrian safety and to reduce traffic congestion by improving wireless communication between and among vehicles, as well as between vehicles and infrastructure such as traffic lights and other traffic control systems.

GM has successfully conducted research and development of vehicle-to-vehicle ("V2V") and vehicle-to-everything ("V2X") technologies in the 5.850-5.925 GHz band under its current experimental license granted by the Federal Communications Commission ("FCC") under call sign WK2XWJ (OET File No. 0111-EX-CN-2020). That license allows GM to perform bench tests and undertake associated short-distance drive testing within 5 kilometers of ten manufacturing and related evaluation sites in Michigan and Arizona.

Pursuant to Sections 5.3 (e), (f), (h) and (j) and 5.53 of the FCC's rules, 47 C.F.R. §§ 5.3 (e), (f), (h) (j); and 5.53(2021), GM now seeks to expand its research and development to conduct tests in real-world environments to evaluate the performance and functionality of cellular vehicle-to-everything ("C-V2X") technologies operating in the 5.895-5.925 GHz band. Accordingly, GM respectfully requests a 24-month experimental license beginning on May 1, 2022, to supplement its testing capabilities as discussed in greater detail below.

The following provides additional details regarding this request.

A. Need for License and Locations of Proposed Operations:

As noted above, GM seeks to supplement its authority to conduct research and development to perform tests in real-world environments to evaluate the performance and functionality of C-V2X technologies to advance driver and pedestrian safety and to reduce traffic congestion. It proposes to operate a limited number of mobile-only on board units ("OBUs") and temporary fixed road side units ("RSUs") at its test site located at the Milford Proving Ground in Oakland County, Michigan (center coordinates 42 -35 -3.55N; -083-40-49.80W (NAD83)).

In addition, GM proposes to operate a limited number of mobile-only OBUs at various locations in the United States. As such tests would be conducted at locations that are not known at this time, and to provide GM flexibility to conduct such tests without the need to provide the FCC with site-by-site information, GM respectfully requests authority to conduct experimentation on a limited, mobile-only basis at locations in the continental United States ("CONUS").

GM does not seek authority to conduct market studies or provide communications services under the requested experimental authority. The primary participants in the research are employees of the company and will be advised that: (a) the operations are being conducted under an experimental authority issued to GM, (b) the company is responsible for the experimental activities, and (c) after the tests are completed, GM will retrieve or disable all devices that do not comply with FCC regulations. GM understands that the FCC may specify these as well as other conditions on its authorization.

B. Technical Specifications:

1. Frequencies Desired

GM proposes to test and evaluate C-V2X equipment that will operate in the 5.895-5.925 GHz band.

2. Power Levels

GM proposes to operate with the minimum power level needed to conduct its evaluations. It plans to deploy units that will operate with a nominal Effective Radiated Power ("ERP") of 0.12 Watts, based on a mean Effective Isotropic Radiated Power ("EIRP") of 23 dBm or 0.20 Watts. In no event will GM operate devices that will exceed a mean ERP of 1.21 Watts, based on a mean EIRP of 33 dBm or 2 Watts. All power levels will comply with the limits set forth in the FCC's rules applicable to C-V2X technologies.

3. Modulation and Emissions

The primary emission designators for the proposed operations are 10M0W7W and 20M0W7W. Other emission modes may be utilized, but in no case will the emissions extend beyond the frequency band requested.

4. Equipment To Be Used

GM proposes to conduct its evaluations deploying both authorized and prototype equipment. The manufacturers and model numbers for the equipment to be deployed have not been determined at this time, but as noted above all equipment will be operated consistent with the technical specifications described in this exhibit. In no event will the number of OBUs deployed under the requested license exceed 100 in the aggregate, either prototype or authorized. The number of RSUs (to be deployed (and only at the Milford Proving Ground location) will not exceed 10, either prototype or authorized.

5. Antenna Information

GM may wish to evaluate a variety of antenna orientations and heights. Any antennas will be installed in accordance with Federal Aviation Administration ("FAA") and FCC rules and regulations.

C. Protection Against Interference:

GM does not expect interference to occur, as its tests will be conducted only on a limited basis as described in this exhibit. Specifically, GM does not plan to operate more than 10 RSUs (and, again, only at the Milford Proving Ground) or operate more than 100 OBUs under the authority requested in this application. In addition, as noted above, GM proposes to limit the power levels of its operations to the minimum necessary to conduct its evaluations and will not exceed the power levels established under FCC rules.

Moreover, GM notes that it has not received any reports of interference based on the experimental operations conducted under its existing license. Indeed, multiple other institutions, agencies, municipalities, and governmental transportation departments with licenses are cooperatively experimenting with the same technologies, incurring low probability of interference.

Nevertheless, should the company receive a complaint of interference resulting from the proposed operation, GM will take immediate action to address the interference including, if necessary, discontinuing its operations. As noted below, GM has designated Mr. Curtis Hay as the technical contact for this request and to serve as the "stop buzzer" in the event that operations must be terminated because of any interference concerns. He can be reached at telephone: (313) 920-3872; email: Curtis.1.hay@gm.com

D. Public Interest Statement:

GM submits that issuance of an experimental license as requested is in the public interest, convenience, and necessity. Grant of an experimental license will permit GM to test and evaluate the performance and reliability of C-V2X technologies designed to enhance driver and pedestrian safety and to reduce traffic congestion by improving wireless communication between and among vehicles, as well as between vehicles and infrastructure such as traffic lights and other traffic control systems.

E. Contact Information:

FCC Counsel:

For questions about this application, please contact:

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Technical Contact/Stop Buzzer Contact:

In the unlikely event interference concerns should arise during the period of authorization for this license, please contact:

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